



# MAGAZINE

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## More Sulphuric Acid

By J. S. Dunn (Billingham Division)

Four years ago output of sulphur from the United States threatened to lag behind demand and produce a shortage of that most vital of all industrial chemicals, sulphuric acid. Production of acid from our native raw material anhydrite was therefore stepped up. Here is the story of why and how a huge £7m. capital programme for sulphuric acid was launched.

SULPHURIC acid is one of those things of which little is heard so long as there is enough to go round. It is not a household article, and no stars of stage or screen engage their charms to urge us to use more of it. Nevertheless it is deeply, if remotely, enmeshed in our national economy, and its importance is greater rather than less because of its remoteness from our normal contacts and daily experience. It is used in the very first stages of the manufacture of many products, and it has been said that the prosperity of a country can be gauged by its output of sulphuric acid. This observation is now neither novel nor original, but none the less it remains very true.

Very large quantities of acid are used in making superphosphate, a basic fertilizer of immense importance. The gas and coke industry take a great deal, producing another fertilizer from it—sulphate of ammonia. Much goes to rayon manufacture and to the comparative newcomer to industry, the brilliant and powerful white pigment, titanium oxide. Sulphuric acid is essential to the chemical industry in general, including dyestuffs, plastics and fibres, and to a host of other industries and products. Selected at random are oil, sugar, sewage, explosives, accumulators, leather, iron and steel.

If, therefore, there is to be a general increase in national production there must be a corresponding increase in the supply of sulphuric acid. This deduction was amply borne out when, after the war, the drive for increased production produced a demand for more sulphuric acid. At Billingham the existing units were immediately stepped up to maximum output,

but there then arose a sharp step in demand owing to the projected expansion of output of titanium white by Billingham works of British Titan Products.

Sulphuric acid can be produced in quantity from sulphur, from pyrites and from anhydrite. There are other starting materials such as spent oxide, but since these are by-products the total available supplies are local and limited. Now nobody in his senses would choose any other raw material than sulphur, especially if he wants the acid in a hurry. Sulphur plants are standard, cheap, simple and easy to operate, and are efficient and economical from small to very large outputs. Many sulphur-burning plants were, in fact, installed during and immediately after the war, including one at Billingham, and for a time everybody was happy.

There is, however, just one problem in connection with sulphur-burning plants, but that is a big one—where does the sulphur come from? The answer quite simply is—America.

There are, of course, large areas of the earth which have not yet been explored geologically; but the type of structure of the earth's crust in which sulphur occurs is known to be rare, and the chances of further large sulphur deposits are correspondingly small. The American report "Resources for Freedom" concludes that known reserves of cheaply obtainable sulphur will be exhausted by 1970.

It follows that two things are likely to happen. The price will tend to rise, and the American continent will tend to safeguard its own industries by discouraging export. The price has already risen by about

three times since 1935, and there was a restriction of sulphur export in 1950–51, when American local consumption began to overtake output. Furthermore, sulphur imports require dollars. It is not necessary to comment further on this consideration. So the happy vision of easy and cheap acid from sulphur, like youth, is "a stuff will not endure."

*High Capital Costs*

A pyrites plant costs about twice as much as a sulphur plant for a similar output; but once again, while the pyrites reserves will probably see us through to the end of the century, we have none in the United Kingdom and imports affect adversely the balance of trade.

A plant to produce acid from anhydrite costs about four times as much as a sulphur plant and has to bear heavy charges for depreciation, interest and overheads; but having said that, you do know where you are. Furthermore, in an inflationary period some of these charges are self-cancelling. There are very large reserves of anhydrite and gypsum in Britain and in the world in general. In fact Billingham is literally "sitting pretty" on an enormous anhydrite raft extending over much of the north-east of England.

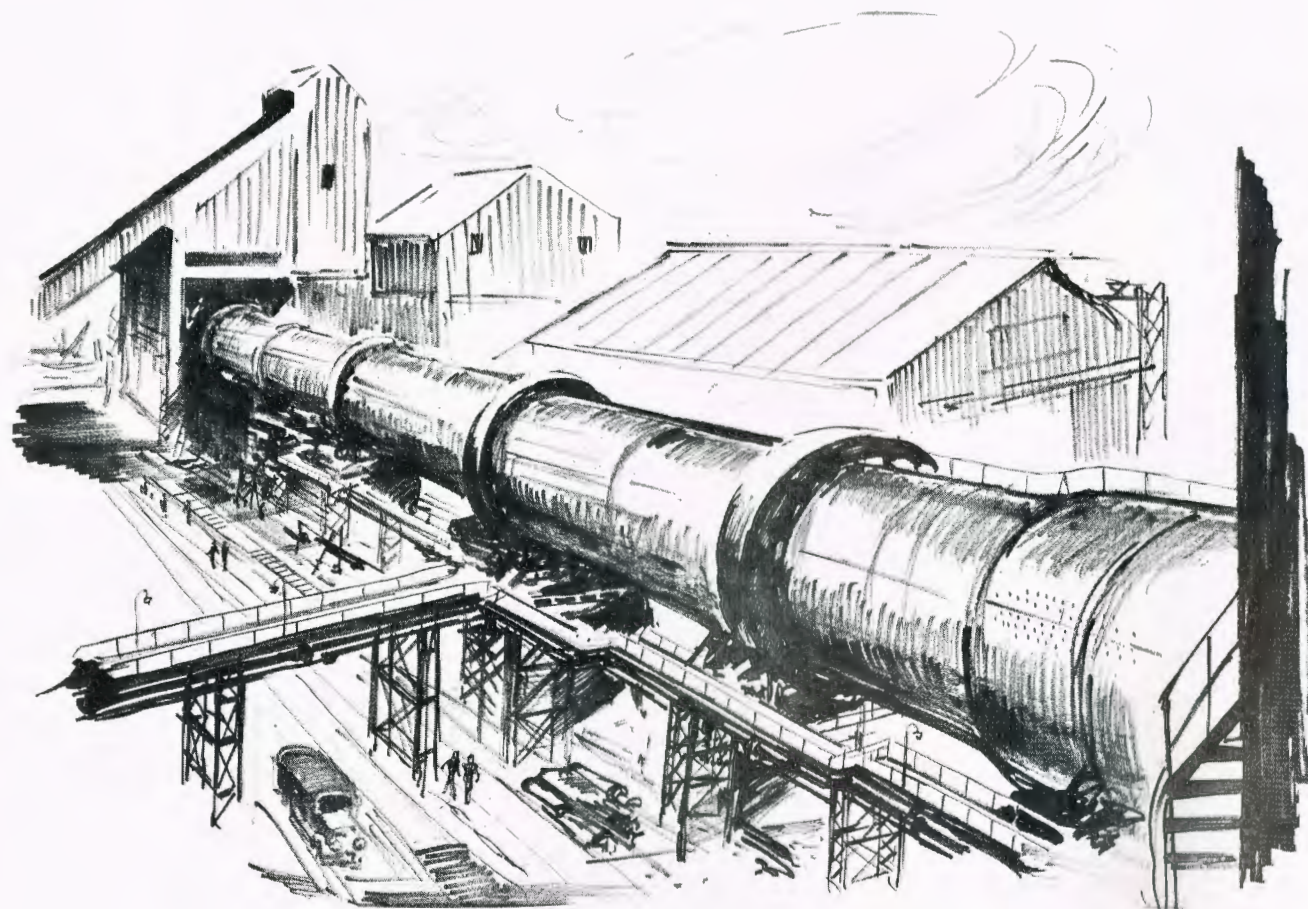
*Cement as By-product*

One more very substantial item standing to the credit of the anhydrite process is that for every ton of acid you get in addition one ton of Portland cement derived from the part of the anhydrite mineral which remains after extracting the sulphur. This constitutes a welcome asset to the national economy and a valuable financial aid to the process.

When Billingham was faced with a demand for immediate expansion of acid output after the war it was realised that sulphur was the quick answer to the problem. There were insufficient resources available at the time either to design or to build plant to utilise our own raw material, but there was a very strong body of opinion that in the long run further anhydrite units would have to be built.

In 1947 a very thorough investigation of the proposal to extend the anhydrite plant at Billingham was made, but the project hardly seemed sufficiently attractive economically compared with the sulphur and pyrites processes. The sulphur shortage of 1950–51 administered a sharp shock to various organisations who had built sulphur plants and there was a general move throughout the country to turn over to pyrites.





*The new sulphuric acid kiln at Billingham in which anhydrite, clay, sand and boiler ash are burned to make sulphuric acid and cement*

The shortage strengthened the position of the anhydrite process, but pyrites were still a competitor economically. Eventually, largely owing to the support of Sir Alexander Fleck, the situation was resolved. We would go forward with our own material, anhydrite.

Meanwhile the demand for acid had been piling up at an average rate of increase of 3% per annum since 1945, and a demand for over 200,000 tons per year could be foreseen.

This would require three large units, one at Billingham and two others elsewhere to be going on with. It would also require a very large sum of money—something like £7,000,000. It would absorb much steel and concrete and would require the services of many engineers and draughtsmen. I.C.I. was heavily engaged with other projects, such as nylon and 'Terylene.' Two decisions were engendered by this situation. The first was to invite the co-operation of potential acid users in financing and operating a plant to take care of their own requirements. The second

was to place the responsibility for building the plants with a firm of chemical engineers.

As a result of the first decision the United Sulphuric Acid Corporation was formed, with Courtaulds, Fisons and I.C.I. as major partners. I.C.I. would supply technical knowledge, supervise design and start up the plants. U.S.A.C. would finance, manage and operate. To implement the second decision the building of the plants was made the responsibility of Messrs. Simon Carves.

In January 1951 Simon Carves were able to say that they were interested in such a proposition, and in February the first joint meeting between I.C.I. and Simon Carves took place. The first technical meeting took place at Stockport in the following March, when the general design of the plant was laid down. Progress on planning, flowsheet, cost estimates and all the necessary preliminary work was rapid, helped considerably by the report written in 1947.

Once work had been started, progress followed the usual pattern of plant construction and was on the whole very good. The Billingham plant was to be

completed first, and the original date for handing over was September 1954. Some items were available for trial in October. The inevitable minor modifications were finished by the end of December, and on 21st December the first trial run was made.

This trial run on 21st–22nd December was comparatively short (25 hours), but it showed up a number of points where further modifications were vitally necessary. The second trial was due to begin on the morning of 1st January, but the number of process workers who came in with the dawn was judged to be inadequate. New Year's Eve is treated as an occasion on Tees-side, and is celebrated accordingly. A start was made on 2nd January, and this run lasted ten days. More modifications, minor but essential, and another start. This pattern of events continued, with longer and smoother periods of production, and at the end of the first three months the plant had produced just under 70% of its designed output.

The experience gained at Billingham was turned to good account on the United Sulphuric Acid Corporation plant at Widnes. Staff, foremen, chargehands and key workers for this enterprise had been trained at Billingham in a school specially organised for that purpose. Led by a small team of staff and supervisors from Billingham, the United Sulphuric Acid Corporation have achieved a remarkably smooth start-up of the two kilns and associated acid plant which constitute their factory.



*Another aspect of the new sulphuric acid plant is this tall gaunt chimney which carries away waste gases*

Both units are now in regular production. There are still difficulties to be overcome at both Billingham and Widnes, but it can already be seen that the three large units, one at Billingham and two at Widnes, each 50% larger than any previous units and each capable of making 75,000 tons of sulphuric acid a year and an equal amount of cement, are a success and a most valuable addition to the productive capacity of the country.



# THE EMBOSSEUR

"THAT crocodile's about ten years old," said Bill Ollerenshaw. "And there's a bit of wear in it yet."

As he said this he caressed the crocodile expertly. But there was no question of evading snapping jaws or thrashing tail, for Bill's croc is a very tame affair—a five-foot-long nickel-plated embossing cylinder mounted on a big machine at Leathercloth Division's Hyde Factory. It enables makers of handbags, travel goods, shoes and radio sets to employ embossed 'Rexine' or 'Vynide,' which is not only almost indistinguishable from the real thing but much cheaper and less wasteful. Real crocodile skins are comparatively small and awkwardly shaped, while embossed coated fabrics are normally 50 in. wide, as long as you please, and usable to the last inch.

Bill was about to start a new run on the embossing machine. The embossing cylinder had already been mounted in its place. Above and below it were two other cylinders. "We call them bowls," Bill said. "They're made of compressed cotton, and if you look carefully you can see that they have the crocodile pattern on them too."

The condition of the bowls is as important as that of the embossing cylinder itself. The coated cloth runs between the embossing cylinder and the bottom bowl, and the bowl takes up the immense pressure used in the process. When a bowl comes to the factory it is quite smooth, and it must be "run in" with an embossing cylinder until it receives a clear impression of the embossed pattern. The bowls Bill was using had already been run in, but now he washed them down with warm water to make sure that they were scrupulously clean and also to swell the cotton slightly in preparation for the run.

"Now for the pressure," Bill said. "It varies according to the depth of the pattern you're embossing and the type of cloth you're using. For this run I'll need ten tons to the square inch."

He moved a lever until the appropriate reading appeared on a dial. Then he turned his attention to the temperature. The embossing cylinder is hollow, and steam is supplied to the inside. The face is made cool, warm, hot, or very hot—again according to the depth of the design being embossed. Bill set the steam supply to hot and waited for the cylinder to take up the heat.

"You only use a heated embossing cylinder with 'Rexine,'" he told me. "That's the nitrocellulose coated fabric. With 'Vynide,' which is coated with p.v.c., the embossing cylinder is cold but the cloth itself is heated."

Satisfied now with the temperature of his cylinder, he started the machine. A 600-yard length of cloth was waiting to be embossed, but first he fed in a test piece. After inspecting it Bill thought it wise to make a slight adjustment to the pressure—it was one of those things, he explained, that only experience could tell you, and he has had thirty years of it.

It takes two men to start the run, and on the care they use depends the whole success of the piece. Bill took the end of the cloth and deftly fed it between the revolving cylinder and the lower bowl (a guard prevents him from feeding in his fingers as well). At the other side of the machine his assistant stood ready to receive the cloth as it emerged. As it came out he seized it firmly, so that the right amount of tension would be exerted until he could fix it to the receiving spool. Both men were alert for any sign of a crease or a wrinkle or misalignment. Once a crease starts it may impress itself on the bowl and be perpetuated throughout the length of the cloth.

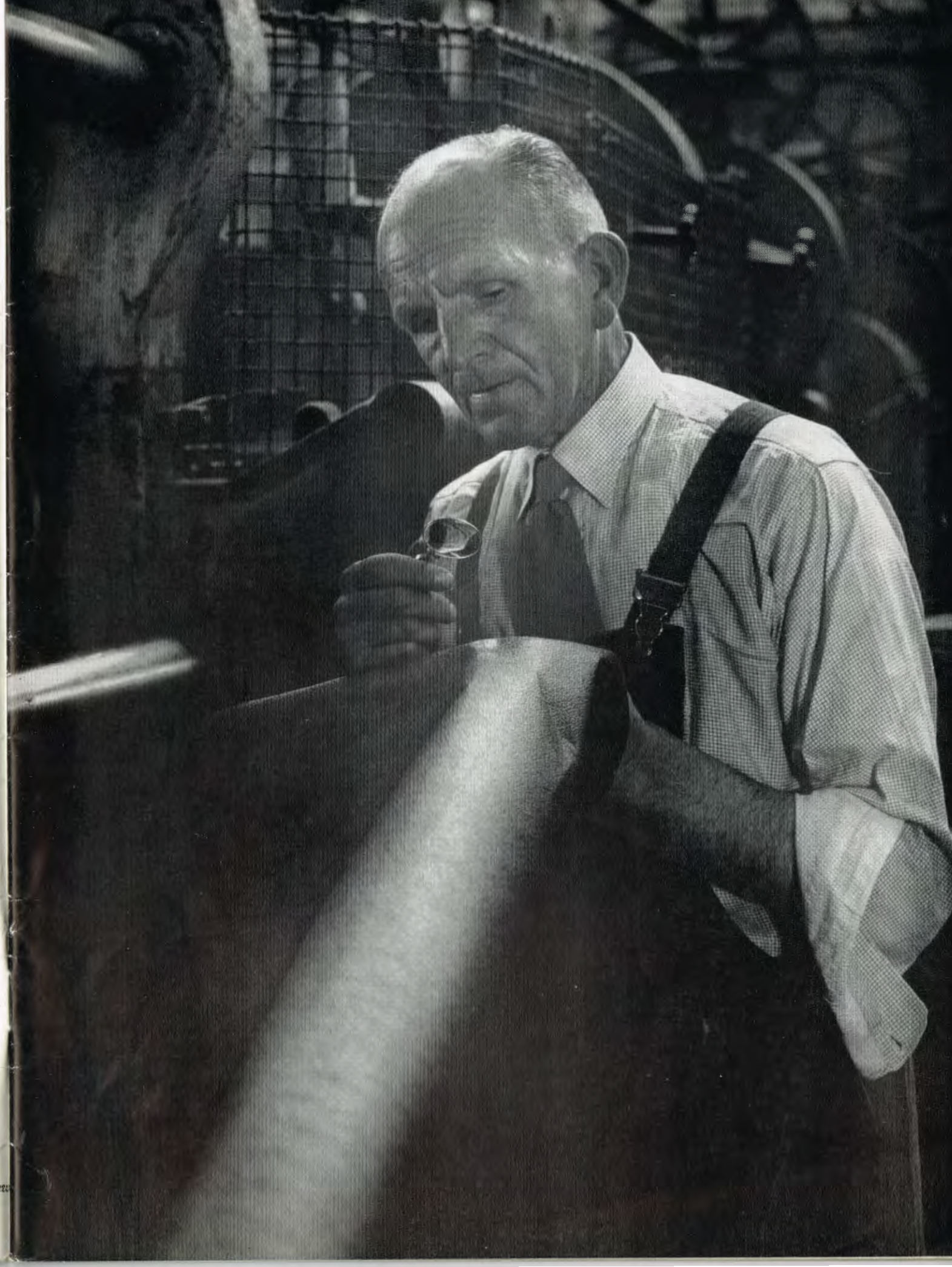
Once the piece was running Bill was content to give it a pat here and a smooth there and to keep an eye on the temperature and pressure. He had time to tell me of his early experiences; of how he started at the age of 13, mixing dope for 'Rexine,' graduated to the post of full-blown mixer, then became a cloth dyer and a colour mixer in turn. In those days 500,000 yards of leathercloth a year was considered good output; now it is measured in millions of yards a year.

"Yes, there have been plenty of changes since then," he said. "One of the jobs I had in the spreading department was called 'mark-watching.' I sat in a perch called a cradle, and every time I saw a mark on the cloth which indicated a seam I'd have to shout to the spreader 'Seam coming!', and he'd make allowance for it. In those days we checked the thickness of the coating partly by eye, partly by micrometer—you can guess how accurate we were. Now it's done by radioactive particles."

The interesting part of Bill's job is that he is always meeting the results of it in his life outside the factory—on a handbag, a radio set or a chair.

M.J.D.

Bill Ollerenshaw





# Information Notes

## ROUND EUROPE IN 26 DAYS

By Edgar Fuchs (Alkali Division)

*Recently Mr. Edgar Fuchs, an Alkali Division engineer, was a member of an O.E.E.C. mission which visited 32 factories in 11 European countries in a lightning tour of 26 days. Here is an account of the lighter side of a trip, in which many men of different nations made friends.*

OFFICIALLY the Mission began with one of those Paris meetings, well known from newsreels, in which little groups of men sit behind long tables with placards saying ICELAND or TONGA or such things as PAYS-BAS or ROYAUME-UNI. But this placarded meeting was merely the calm before the storm—a meeting at which formalities such as the provision of money and tickets took place. Setting out the next day, the Mission was to visit eleven countries in twenty-six and a half days, incidentally writing supposedly intelligent reports on thirty-two engineering works and four research laboratories en route.

The official languages being French and English, this gave a flying start not only to the French and British but also to the Americans, the Canadians, the Belgian and the Irishman; but reports were also duly written by all the other fourteen members—engineers from Norway, Sweden, Holland, Germany, Austria, Switzerland, Italy, Portugal and Greece. That made us Englishmen think quite hard.

The skill in languages of most Europeans always does come as a surprise. Lazarus Lazarides, our Greek colleague from a fertilizer factory, was the star turn in this respect. Middle-aged, he had never been away from Greece before, but set to with Linguaphone records to study English and German. His pronunciation was exemplary, and his vocabulary quickly increased during the trip. Loving a joke even if it had to be explained with some labour, his little notebook kept having added to it such gems as:

There was a young lady called Wright  
Whose speed was far faster than light.  
She set off one day  
In a relative way  
And returned on the previous night.

Yes, we got to know and to like each other very well on this Odyssey. A delightful Italian engineer, Antonio, found languages much more difficult, but we laughed at the same things. One evening in England a hearty meal made one of us remark "Well, tummy's touching table." After every good meal Antonio pronounced gleefully "T.T.T.," and his T's sounded as clean and beautiful as only Italians can make a simple consonant sound.

The days in England, though meriting what became the Mission's slogan, "Not enough time," produced such good weather, good organisation and good parties that one felt happy and proud. A reception in that beautiful mansion Lancaster House, in a glorious room looking over the Mall and St. James's Park with evening sunshine, will be remembered by all.

It is astonishing what one can see in Holland in three days, helped by the flatness of the country and its excellent road system. Their double-track roads put us to shame, as does their road tunnelling round the centre of Rotterdam. One very long day of "investigating" ended in the Keukenhof, the spring showpiece of the bulb-growers, with masses of daffodils, narcissi and early tulips in a wooded undulating park. Dozens of perfect square orderly beds of the choicest Darwin tulips made a great sea of colour under glass—every colour, from white to a very presentable black.

The "free Sunday" in Brussels, with the typical sunshine of the tour, allowed more sightseeing. How really lovely is the old Grande Place, into which neither trams nor rebuilding have been allowed to penetrate. The square serves a multitude of purposes. That Sunday morning was the bird market. Thousands of birds in very small cages may make one sad, but here one had the feeling

that there was a lot of real love, and the conditions and colours of them all were perfect. Budgies, canaries and pigeons of all sorts were there and many other varieties too, some bright, some just homely.

By midday the market had simply vanished, and once more the stately palaces and guild houses of the seventeenth century looked down on the peaceful, sunlit cobblestones, while a platform for the afternoon's political meetings was being built at the upper end.

After two days in Belgium of bussing and tramping through works and extensive laboratories, we found ourselves at Liège heading for Germany and piling hastily into the "Saphyr," that really noiseless, steady and fast train which there is nothing to touch on British Railways.

Perhaps the chief surprise in Germany was to find that much of the Ruhr valley is beautiful. We had expected a continuous black country. The urge and endeavour one knew of, so it was less surprising; but it is terrific all the same. Here is a land of amazing energy and purpose, rebuilding itself with a vigour hard to describe. It was interesting and cheering to find in a trade school for young welders a large notice: "Be good Europeans, you have seen what war brings (photos of war damage). Work for peace and a high standard of living (pictures of new trains, cars, houses, etc.)." Surely very encouraging! The evening brought pleasant meals and then bed for most, a trifle of night life for others.

The next move was to Zürich. My neighbour in the plane was an Indian chemist in pharmaceuticals, so there were mutual friends in I.C.I.—a very small world nowadays. Like all the other ports of call, Zürich was bathed in perfect sunshine. The lake was blue, and spread out behind it were the glorious snowy eastern Alps. There were hundreds of sailing boats on the lake, and thousands of people sauntered along the promenades on the banks enjoying a typical Continental Sunday. How happy and cheerful they all looked—in contrast, it struck me, to Dusseldorf, where the looks are determined and purposeful, some perhaps hard, certainly not many joyful.

A homely *Zunft* restaurant, one of the guild meeting places of old, provided the right sort of meal and the hotel a good night in readiness for a hot day's work touring the miraculously tidy factories, where disposal of a cigarette end presents a problem. Each fitter at the bench has a broom at hand, and they certainly use them. We knew



... the mission began

from past experience that the same tidiness holds good in chemical works, where it is much more difficult to achieve.

Matching the Swiss exactness, the Mission was absolutely determined to time this one precious day to a minute, for Zürich is one of the finest shopping cities in Europe. We were due back in the town at 6 p.m., the shops closing at 6.30 p.m. and the train for Milan leaving at 7.15 p.m. At 5.58 the bus drew up at the hotel, and at 5.58 and a quarter it was empty. The passengers vanished into thin air—to toy shops, clothes shops, philatelic specialists and the like. Parcels large and small appeared with the luggage at the station, and, as usual on these journeys, not a single member was missing or late. It was a remarkable team in this way.

Five hours later we were in Milan, more or less sleepwalking by this time but well shepherded by Antonio Lo Giudice, the "T.T.T." enthusiast. Next day, after a pleasant bus run to the small town of Brescia, we realised once more what kind, gracious people the Italians are. Their manner of receiving us at their works, the lunch provided and the wines—everything had the feeling of rightness. But Italy really only flashed past in a dream, with the first arrival in Milan at 0.29 (in other words, half-past twelve at night), and then after two long days of visiting works a start was made for Marseilles after a 5.30 breakfast at Genoa station. It was there, and at this early hour, that Clarence Jackson, a most delightful colleague from Niagara Falls, remarked "I sure can't figure out why that fella



... spread out behind

Columbus ever left this place to go to America. After all, there was nothing for him when he got there."

After a train journey through the Riviera of seven hours the wheel had turned full circle and we were back in France and nearing the Odyssey's end. The "Mistral" train from Nice showed us in use the stainless steel coaches which we had seen being built in a dim past existence—in fact just over three weeks earlier—near Rouen.

Then, after a visit to a factory near Arles in the district beloved by Van Gogh and after a sunny day made doubly attractive by the cheerful atmosphere and unforced French hospitality, we were once more back in Paris, at midnight by plane.

The friendships made will, some of them, be for life. Not often can twenty-eight men of such a varied assortment have enjoyed each other's company so greatly.



# BETTER BUSINESS LETTERS

By Michael Danckwerts (News Editor)

*A million and a half letters a year are sent out from I.C.I. sales offices, most of them to customers. If they are clear, complete and helpful they can be a great force for goodwill—hence the Sales Control Department's campaign against woolly "Business English."*

ANYONE who writes a letter from an I.C.I. sales office beginning "Dear Sir, We are in receipt of your esteemed favour of the 5th inst., and beg to inform you..." will almost certainly be in receipt of his Sales Manager's displeasure. Since 1953 courses in letter writing have been held for sales staff all over the country, and "esteemed favours," "inst.," "ult.," "prox." and any form of "begging" have become definitely taboo, along with many other words and phrases from that pompous and serpentine language known as Business English.

Business English, the students are taught, is anything but businesslike. It is shorter, sweeter, and far more businesslike to refer to a letter as a letter than as an "esteemed favour." And if a husband never says to his wife on a shopping expedition that "the position opposite detergents is difficult," why should a correspondence clerk write to a customer that "the supply position opposite salt is difficult" when there is merely a shortage of salt?

The students are shown how to replace such cumbersome and nebulous phrases as "in respect of," "with a view to" and "with regard to" by simple prepositions. They are urged to use the active rather than the passive voice, to guard against unnecessary adjectives, and to shun abstract nouns and genteelisms. They learn, in short, not to mince matters or wrap them up in clouds of verbiage.

These elements of plain writing are the backbone of the course, and they gain acceptance easily. The students put them into practice by writing exercises, which become progressively more difficult and call not only for a grasp of plain English but an appreciation of how good letters can be sales tools and time-savers and how bad letters can spoil the work of others. Clarity and simplicity, completeness and accuracy, orderliness, brevity and helpfulness are given as the ideals to strive for. The students are asked to study examples of bad letters and put right what is wrong with them. They are handed letters from anxious, defaulting, testy or bewildered customers and asked to compose replies. Under the chairmanship of

each of the students in turn the efforts of the course are discussed—the blushes of offenders being spared by the practice of leaving all exercises unsigned.

Here is a letter—a genuine shocker written some years ago—that is cited as an example of how *not* to write to a customer; long on verbiage, short on tact, it also illustrates well how a letter can take on a bureaucratic flavour when the writer fails to realise that to the customer he is I.C.I., not a mere conveyer of decisions taken by other units of the Company:

*We are in receipt of your esteemed favour of the 18th inst. with further reference to the missing packages and would now advise that after further consultation with our Works regarding the matter they are prepared to accept in full settlement half the value of our debit note issued for the missing empties and credit your account with the balance from their Suspense Account.*

*For your information we would state that many empties are received back by our Works without any labels and in consequence they are unable to identify the senders and credit their account. They ask us to point out, however, that they cannot accept responsibility for missing packages in the future unless these are properly labelled with the full name and address of sender and suggest it is of importance to bear in mind for the future the following considerations:*

- 1. When empties are despatched to our Works they should clearly show the name and address of sender and a signature should be acquired from the Railway Company and be available for our inspection if necessary.*
- 2. An advice should be sent when empties are returned to this office on the day they are forwarded.*  
*Assuring you always of our best attention.*

An adequate re-draft of this letter is:

*Thank you for your letter of 18th March. Since you are certain that the railway carter collected the empties, although he did not sign for them, we are prepared this time to accept half the value of our debit note in settlement.*

*You will recognise from this unfortunate incident how essential it is that all returned empties should clearly show*

*the full name and address of the sender and that a signature should be obtained from the railway. In addition, we should be informed on the day of despatch so that we can claim on the railway, if necessary, within the statutory period allowed for such claims.*

*Unless these steps are taken we cannot accept responsibility for missing packages.*

Sometimes the written exercises reveal in the mind of the younger writer too great an impulse to express regret for some official action he must necessarily defend. For that reason there is set, towards the end of the course, a letter from an obviously irate customer to which each student must reply by dictating direct to a secretary.

This is the letter:

*With reference to the visit paid to our office by one of your representatives this morning, we are given to understand that he was definitely sent out to make a collection of your February account amounting to £37 1s. 3d. Please find enclosed our cheque for this amount. As stamp receipt is on reverse of cheque no further acknowledgment is necessary.*

*This is the first time that we have ever had a representative from any firm call at our office with the express purpose of collecting money, and we take very strong exception to this attitude. We have given this matter careful consideration and the writer is only sorry that he was unable to meet your representative, and we have definitely come to the decision that unless we receive an apology and some explanation for this unseemly visit we shall, without further intimation, settle your account in full and obtain our supplies of sodium hypochlorite, sodium carbonate, soda crystals, caustic soda, etc., from other sources.*

*We are quite aware that we may have to pay a little extra, but this we are prepared to do, and we certainly will not put up with any representative from I.C.I. Ltd. or any other firm from whom we are purchasing supplies coming to our office and explaining to our staff that they have come with the express purpose of collecting an account.*

*Whilst writing we shall be pleased to have the name of the official who issued the order for this representative to make this visit, and we will certainly take it up to the highest level with your firm, as we feel that this is definitely in contradiction and most undesirable, in view of the many years of good business relations between our two firms.*

*In conclusion we can only emphasise that we take a very serious view of this procedure, as above explained, and we shall certainly under no circumstances tolerate it, and it is left entirely in your hands as to whether we do any further business with you or otherwise.*



... guard against unnecessary adjectives

A senior member of the sales office at which this thunderbolt was supposed to have been aimed was once sitting in at a letter-writing course as an observer and volunteered to try the exercise himself. His reply is now used as a model for students to discuss after they have criticised their own efforts:

*We have received your letter of 23rd April and thank you for the cheque for £37 1s. 3d. enclosed.*

*It is a standing instruction that representatives should call upon our better customers when their accounts are overdue. So far from wishing to embarrass them, this is done to prevent more formal action being taken which might very easily make it difficult for us to continue trading with them.*

*You have referred to the fact that to purchase elsewhere would cost you more, and we would like to say that it is only because the bulk of our customers pay their accounts at the due date that we are able to keep our prices as low as they are.*

*With this in mind we feel sure that you will be willing to resume our former pleasant relationship with all the goodwill that there has been between us, and we trust that we shall be able to continue to do business with you on the terms of which you were reminded by our letter of 31st March 1952.*



... an impulse to express regret

The first I.C.I. letter writing course was held in Dublin. It was exclusively for sales managers, who were at first sceptical about the whole scheme. By the end of the course they were declaring that it was highly useful and showed no reluctance to nominate members of their staff for future courses. Some Regional managers, their deputies and a number of Regional sales managers have, indeed, sat in at the "Lessons" to

demonstrate their support of them. The courses consist of four three-hour sessions, and they are attended, in the main, by sales correspondents of widely varying experience.


Junior staff are sometimes apt to feel that they will lose face with their superiors if they forgo the time-honoured circumlocutions in favour of a terse preposition or two, and occasionally this may be true. The Training Section of Sales Control Department has sufficient confidence in the course, however, to feel that the value of the "new style" in correspondence will be increasingly recognised, and to hope that those who have taken the course in their own younger days will in turn become the guides of incoming juniors, who will thus start off on the right foot.





## GARDEN NOTES

By Philip Harvey



**N**OVEMBER is generally regarded as an ideal month for taking cuttings of red, white and black currants and gooseberries, also for planting new fruit trees and bushes. There is certainly nothing complicated about propagation by cuttings; unlike the taking of *rose* cuttings, it is an infallible method which is standard practice among commercial growers.

Cuttings of red and white currants are taken from shoots made during the summer. They should be 12–15 in. long. Remove all buds except the top three or four, otherwise they start to grow, preventing the formation of a proper “leg.” Dig a narrow trench about 7 in. deep and then push the cuttings downwards to about an inch below the bottom. They are best planted 6 in. apart, and if you have more than one row allow not less than 2 ft. between rows.

Make sure you tread the soil down very firmly round the base of the cuttings, otherwise they will not root properly. This also applies to propagation by cuttings generally, loose planting being a frequent cause of failure. The oft-repeated advice to go over your rows of cuttings after a sharp frost and re-firm as necessary is still sound.


**G**ooseberries are grown from cuttings in just the same way as red and white currants; in fact almost any kind of “slip” taken from a gooseberry bush roots quickly. About four buds should be left on the top of each cutting.

Black currants are grown as “stools” and not on a “leg” as with red currants and gooseberries—hence the type of cutting is a little different. Cuttings should be rather shorter, i.e. 8–10 in. after the unripe top has been removed. All the buds are left on, and you must be careful not to remove any basal buds, as these ultimately grow out. You should, however, cut off the base of each cutting close to a bud. Insert the cuttings 5–6 in. deep, leaving at least two buds above soil level.

All soft fruit cuttings can be transferred to their permanent quarters a year later.

Indiscriminate liming is, I am sure, a common fault with amateurs. (Applied before a potato crop, lime undoubtedly encourages scab.) Unless the soil is definitely acid there is no need to lime for fruit trees. You can easily check this point by means of a BDH soil indicator, an inexpensive soil-testing outfit which enables you to determine the pH status of the soil, i.e. the degree of acidity or alkalinity.

**R**ed currants and gooseberries are very susceptible to potash deficiency, which is more prevalent on light soils. Scorching of the edges of the leaves is a sign that more potash is needed, and sulphate of potash or ashes from the garden bonfire applied in early spring soon correct this. It is always worth while working in some potash prior to planting.



I emphasised earlier that cuttings must be planted firmly. This is equally true of fruit trees bought from the nursery. With those fruits which are propagated by budding or grafting, e.g. apples, pears and plums, the union between the understock and the variety must be not less than 3 in. above ground—hence the importance of making wide, shallow planting holes, never long and narrow ones. If your soil is very heavy, it is best to plant almost on the surface.

**D**o not forget to stake your fruit trees, preferably in oblique fashion. Sometimes you can, so to speak, get away with it; but with plums, especially, staking is essential if you are to avoid broken branches which are potential sources of infection by the silver leaf fungus.

With roses and standards in particular, deep planting again provides the explanation for many subsequent failures. The nursery soil mark on the stem denotes the correct planting depth, but you can plant a little higher if you wish. The experts will tell you that the budding union should be just below soil level, but in my experience the earth shifts from the base of the tree as the result of rain and cultivation and as long as you avoid planting deeply the plants will be perfectly all right.


If you have any farmyard manure, do not use it now to cover the rose beds. The proper time to apply this material is in early

spring, after pruning. It will then act as a surface mulch in dry weather. Gardeners used to mulch their roses in winter with thick layers of farmyard manure, on the assumption that protection from hard frosts was essential. Modern rose varieties are, however, extremely hardy, and cold winds in spring do far more damage than prolonged wintry weather.

Shallow planting of tulips usually accounts for “blind” or flowerless bulbs. On light soils the early varieties should be covered with 4 in. of soil, the May-flowering varieties being planted a little deeper, i.e. covered with 5–6 in. of soil. On heavy ground it is usually sufficient to plant an inch or so less deeply.

**A**mateurs are sometimes worried when they receive tulip bulbs which have lost their brown outer skins. This is of no importance, being mainly due to dry weather when the bulbs were lifted in June or early July. Growth and flowering are in no way impaired.

Though daffodils can remain for several years without lifting, tulips tend to deteriorate if left undisturbed. They are accordingly best lifted annually. My favourite tulip is the May-flowering Darwin variety Annie Laurie. This bears goblet-shaped flowers in a delightful combination of flesh-pink and amber. Even on a very light, dry soil the colour is still most attractive. Annie Laurie is shorter than the majority of Darwins and does not usually exceed 16–17 in.





# Underground Beauty

By R. M. Wallis (General Chemicals Division)

The weird beauties of underground caves are today increasingly appreciated, but rarely have they been more successfully photographed in colour by flashlight. Accompanying these photographs is a brief explanation of how these caves and their formations come to be.

*Photographs by the author*

**C**AVES are found only in certain areas of Britain, such as the Mendip Hills of Somerset and the Northern Pennines of Yorkshire and Lancashire. These are the limestone areas, and caves are found only in limestone. This is because limestone is slightly porous and soluble in water, especially in water a bit acid, so that underground streams eat away the limestone, a process of erosion which is assisted by water-borne silt.

Once a cave or underground passage has been formed, then the action of water percolating through the limestone forms the stalactites (from the ceiling) and the stalagmites (from the ground). As it percolates, picking up carbon dioxide from the air and soil acids from the ground, the water dissolves a small amount of limestone. When this minute trickle of water reaches the roof of the cave passage, a drop is formed. This gradually evaporates, depositing a minute amount of calcium carbonate on the ceiling. And when a drop falls to the floor, further

evaporation occurs and more limestone is left behind. If other drops form and fall in the same place for many centuries, then the formations of stalactites and stalagmites which we admire are gradually built up.

Clearly it is a slow process—figures of an inch in a thousand years are sometimes quoted by cave guides—but the process is very variable in its rate of growth. There can be several reasons for this. A slow growth will be promoted by too slow or too fast a drip and by cave air too moist to allow much evaporation. But often growth can be quite rapid. Stalactites a couple of feet long can sometimes be found in mine drainage tunnels only 200 years or so old.

The colours and the shapes are vagaries of nature. Pure calcium carbonate is colourless, but colourless cave formations are the exception. Rusty reds, yellows and browns are the commonest shades and are all due to iron contamination. Blues and greens are also occasionally encountered. Curious shapes—sometimes called angels' wings, elephants'



THE CAVE OF THE BLACK WELL, Swansea Valley. The pillar is the result of a large stalagmite growing to meet the roof. There is no stalactite.



THE SWORD OF DAMOCLES, Co. Clare, Eire. This fine stalactite is 20 ft. or more long (the figure below is foreshortened). This chamber at the end of the cave is rarely visited, since the cave, although short, is very constricted.





ST. CUTHBERT'S SWALLET, SOMERSET. *This is probably one of the most beautiful caves in the country, with a wealth of formations. It is difficult to get through, having a wet and very tight entrance. The water drops give the scale of the photograph.*

trunks and other fanciful descriptions—result from the outline of the rock beneath or from the slow change in the position of the falling drops through the years. Draughts and the height the drops fall from and many other factors all play their part in forming the final shape as we see it today.

How deep can a cave go? Some writers have let their imagination run away with them and have ascribed very great depths to caves. But in fact the deepest cave known is only 2500 ft. deep—a fraction of the depth of some of the deep mines.



UPPER EASE GILL CAVES, WESTMORLAND. *A stalactite flow formed beside the bed of an underground stream. This cave and Lancaster Hole, a mile or so away, have now been found to connect, and the surveyed length of passages in the joint system is nearly ten miles.*

Since caves are confined to limestone, they are obviously limited in depth by the thickness of the limestone beds. A second limitation is due to the fact that although the flow of water into the limestone is virtually unlimited, the drainage at the bottom of the bed may be severely restricted. The lower levels are therefore saturated, and any caves in this region are thus flooded and inaccessible. In this country the top of the limestone is never sufficiently far above sea level for any really deep caves to be possible, and about 500 ft. is the deepest we can

go here. The really deep caves are found in the high mountain ranges like the Alps and Pyrenees.

Horizontally there is less restriction, and caves with several miles of passages all connected to one entrance are not uncommon even in this country.

Today caves are explored for their own sake, as mountains are climbed. This is quite a recent development. Stone Age man penetrated some caves very deeply, as is shown by the remarkable paintings he made there. This was up to 40,000 years ago, but after them no one seems to have bothered with caves very much.

Lead miners used them as dumps for their "deads"—the rock they dug out following a vein of ore—when their mines happened to break into a cave. And a few caves were opened as show caves. Speleology as a science really began only when the Frenchman E. A. Martel started exploring caves about 1880. We began the exploration of caves in this country about the same time. Boyd Dawkins' *Cave Hunting* was published in 1874, and E. A. Baker and H. E. Balch were hard at work on caves about the turn of the century. Following them there are today some dozens of potholing clubs up and down England and Wales whose members are actively exploring and searching for new caves.

Not many years ago a new cave could often be found merely by taking a walk over the ground in the caving areas; but the obvious ones have all been found, and some hard digging is usually needed to clear choked entrances before a cave can be entered for the first time. But many new caves undoubtedly remain to be found, and fascinating finds are certainly waiting to be made. A chance rock fall or collapse may any day reveal a new pothole, or floods may wash away the debris blocking the entrance to an unknown cave.

On the other hand, years of hard work and patient search may fail to reveal the entrance to a cave system that undoubtedly exists.

This is a field where scientific methods have not yet proved very successful. Measurements of the earth's local electrical resistance can indicate the presence of a cave, as can variations in the force of gravity. These



CRAIG-Y-NOS, SWANSEA VALLEY. *A group of stalactites and "sides of bacon" at the side of a passage. The floor is also composed of stalagmite material. This is a well-known cave.*



TUNNEL CAVE, SWANSEA VALLEY. *The twisted stalactite is probably due to earth movements. The floor of this grotto is covered with red calcite crystals. Some long "straw" stalactites are in the background.*

measurements are difficult to interpret, and so far experience has been a better guide. If water sinks underground, there is a good chance that a cave will be there.

A knowledge of the local geology and past experience indicate the most likely place to dig. The result of much effort may then be the discovery of a new cave or of only an impenetrable crack.

Something new always waits to be found in caves. The study of cave phenomena with modern scientific techniques is only just beginning.



# Caribbean Zone

By G. J. Connolly

*Colour photograph by the author*

**The job of working for I.C.I. in the Caribbean keeps you moving from the Bahamas to Colombia 2000 miles away. It is a modern mode of living in an old-fashioned setting.**

“**V**OODOO Rites—Enquire at Desk.” A small card bearing this legend greeted me as I entered my hotel room at Port-au-Prince, Haiti. It was lying on the table top, along with other and more sober information about mealtimes and the views of the management on the entertaining of ladies in one’s room after 9 p.m.

Most of the new buildings in the capital are tourist hotels, and mine was no exception; this explained the existence of the mysterious card, and as I stood under the shower, washing off the dust of travel, I reflected on the sad fate of old religions which have been discovered first by the ethnologists and later by tourists. What, I wondered, must Damballa and his fellow Loas\* think of gents in baseball hats and ladies in sunglasses and unsuitable trousers who intrude on their ceremonies with their flash-bulbs and recording machines?

We of the I.C.I. Caribbean Zone Agency inspectorate staff have a large waterfront to cover. From the Bahamas in the north to Colombia in the south is 2000 miles, while Dutch Guiana in the east is 2700 miles away from Guatemala in the west. As the crow flies, so do we, and the aeroplane is to us as normal a mode of transport as the threepenny bus. As for trains, we seldom see one, and only ride in them when we are on leave in England every three years.

The inspectorate headquarters are in Kingston, Jamaica, the somewhat overheated hub of the Caribbean as far as lines of communication are concerned. There are about twenty-four of us all told. Of these about eight are travelling representatives, either agency inspectors or Division techno-commercial staff.

Almost any day in the year will find three or four of us somewhere about the Caribbean, ploughing a more or less lonely furrow between Divisions and the customer.

\*Loas are the principal spirits in the Voodoo pantheology.

Our work takes us to the oil-fields on the barren shores of Lake Maracaibo, to the bright red bauxite lands of the Guianas and the West Indies, to the modern textile mills in the mountains of Colombia and to the odorous tanneries among the volcanoes of Nicaragua and San Salvador.

Fertilizers for sugar-cane and bananas, alkalis for aluminium and soapmaking, moulding powders and metals, pharmaceuticals and explosives—if variety is what you desire, apply for a job with the Caribbean Zone Agency inspectorate! This exotic sales promotion goes on year after year and is one of the reasons why sales are increasing all the time. In 1954 I.C.I. sold over £3½m. worth of goods in the Zone. Even this figure is capable of great improvement, given adequate supplies and shipping facilities.

Most of the Caribbean countries are growing up, and colonialism nowadays is out of fashion. Today the accent is on political self-determination and economic self-sufficiency—desirable aims which occasionally ignore the facts of life. Nevertheless, agricultural and economic development is being pushed ahead at a sometimes perilous speed: revenue from oil and mineral ores, high prices for coffee and other crops, grants from the United States for hydroelectric power stations and soil irrigation—all these things are increasing the purchasing power of the people and teaching them new skills.



*Salt Creek Bay, Jamaica*

Of course, technical skills are much more easily acquired than social and political wisdom, and there have recently been political explosions, openly in British Guiana and covertly elsewhere. There will be others, for many of these countries are but now emerging from the Middle Ages, and they have to catch up with the twentieth century very quickly. But they have the good will of the Western world, and with the advent of such institutions as the University College of the West Indies, medical schools, hospitals, and universal education the gaps are being closed.

As in Asia today, these countries are going through a social and political revolution, and we are living in a most interesting period in the Caribbean’s stormy history.

I sometimes doubt, though, whether we of the inspectorate staff see much more of the countries we visit than the tourists. As we bump along a dusty road in the agent’s car, clutching to our bosoms a

large leather bag bulging with price lists, catalogues and samples, we may catch glimpses of a world very different from our own world of airline bookings, hotels and taxis.

It may be market day in a mountain village like Chichicastenango in Guatemala, where brightly shawled Indians—dyes by Blackley, let us hope!—amid piles of peaches and apples are preparing for a village dance; or perhaps it is a group of Javanese girls in Paramaribo, dressed in ceremonial green silks, celebrating the end of Ramadân. It may be the smoking crest of Momotombo in Nicaragua, or a fishing expedition for monster arapaima in the interior of British Guiana. It would be pleasant to dawdle—after all, tourists pay thousands of dollars to see and do these things. But we do not seem to have the time, somehow; there is an appointment at the cement factory, or a report to be typed, or a plane to catch . . .



# NEWS IN PICTURES



Television was used in Wallerscote Works to publicise safety consciousness during a safety week, pictures from three cameras being relayed by land-line to viewing points throughout the works. Thrice-daily programmes included panel game "What is this?", seen above being televised in home-made studio. Panel members J. Gozzard, P. J. Pynn, Bill Lamb, H. Watkin and F. Hewitt are watched by workers (right) during lunch-hour break in canteen. Below: "Don't let us down" braces were issued to every man as part of safety drive. (Story on page 344.)



Russian textile experts visiting the National Fabric Fair last month showed great interest in the 'Terylene' and 'Ardil' stand (above). Left: 'Terylene' made its Scandinavian debut when a complete exhibition of fabrics and garments was flown to Stockholm. Picture shows part of exhibition being loaded into Bristol Freighter at Blackbushe airport



Silicones made by Nobel Division saved this parish church at Felton in Somerset. The walls were so damp inside that water was actually running down them. I.C.I. Silicone Resin R220 was applied externally, making church perfectly dry

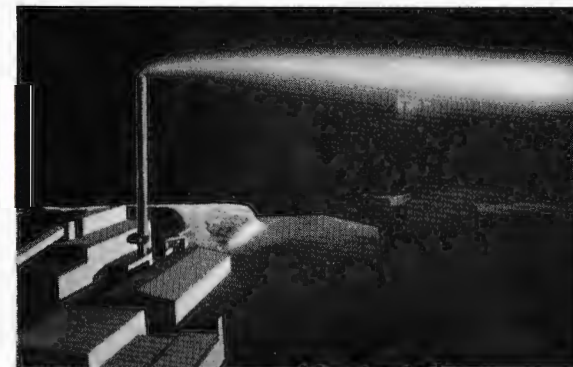




Double glazing of glasshouses can now be carried out for little more than  $\frac{1}{2}$ d. a square foot, using special grade of polythene film evolved by British Visqueen Ltd. Commercial growers who have tried it report reductions in heat loss varying from 8 to 15° F. with corresponding advance of growth in treated houses. Cyclamens (left) pricked out into identical compost in treated and untreated houses showed startling difference after 4½ weeks. Film is sold in 750 ft. and 2000 ft. rolls, under the name 'Thermoplus'



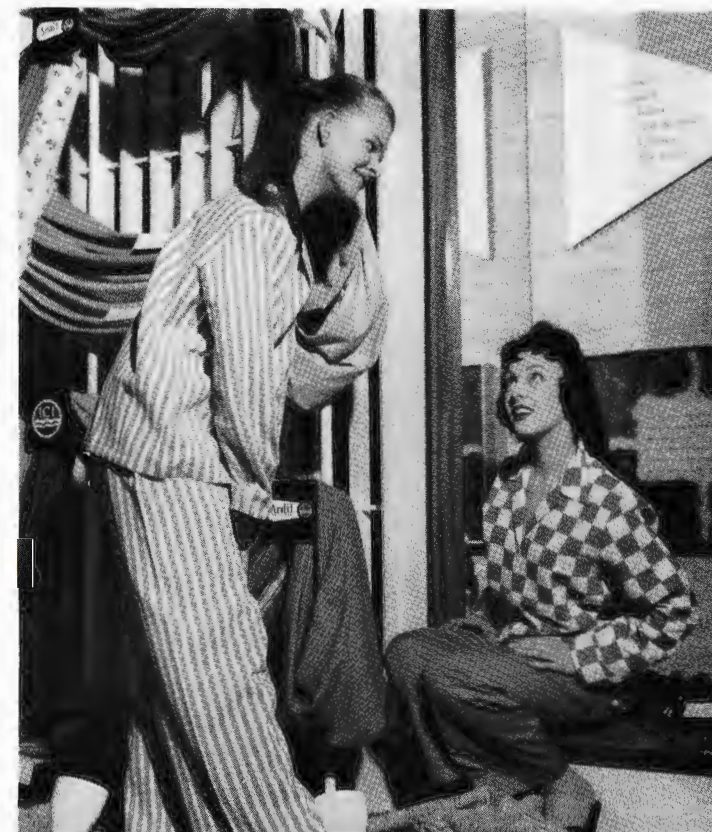
'Terylene' rope, seen here being used on the Thames, has been ordered in substantial quantities by Norway, where it will be used in whaling ships. The rope is twice as strong as those of sisal or manilla and completely resistant to rotting



Model of new Ardeer power station has been tested in Billingham wind tunnel to study smoke performance



Spare-time magicians Alf Twemlow of Dyestuffs (left) and Jill Johnson of Pharmaceuticals (right) watch C. A. Scott of Alkali show trick at magicians' convention



Pyjamas of 'Ardil'-viscose-nylon blend as worn by chorus and some of principals in new musical "The Pajama Game" at the Coliseum Theatre, London, are shown here by Elspeth Ross and Judy Bruce



Half-minute "spots" advertising Pharmaceuticals Division's 'Savlon' are appearing on commercial TV between 7 and 8 p.m. on Mondays and between 5 and 6 p.m. on some Wednesdays. Scene above is from film showing use of 'Savlon' in nursery



# I.C.I. NEWS

## BOARD FUNCTIONS

IN order to relieve Sir Ewart Smith, as a Deputy Chairman, of some of his responsibilities as Technical Director, the Commercial Director, Mr. W. J. Worboys, has assumed responsibility for Government Contracts; the Personnel Director, Mr. R. A. Banks, responsibility for Safety and Civil Defence; and the Development Director, Mr. C. Paine, responsibility for Work Study.

## 'TERYLENE' CHEAPER

Big reductions in the prices of 'Terylene' polyester fibre, ranging between 17 and 27% for filament yarns and 12½ and 16½% for staple fibre, have been announced.

Up till now 'Terylene' has been in the development stage, and prices have been fixed accordingly. The new plant at Wilton, however, is now in production and running smoothly, and as a result it has been decided to put 'Terylene' on a commercial price level. The plant at Wilton is expected to be producing 11 million pounds of 'Terylene' annually by the end of this year.

Among the new prices in the announcement are: 19s. per pound for 25 denier dull filament yarn compared with 25s. previously; and 11s. 3d. a pound for 100 denier dull filament against 14s. 6d. previously. For staple fibres the price for Nos. 3, 4 and 6 denier is 10s. a pound compared with 12s. formerly.

## I.C.I.'s ANALYTICAL TECHNIQUES

Investigations extending over 27 years are embodied in a new book edited by three I.C.I. analytical chemists, Messrs. C. R. N. Strouts, J. H. Gilfillan and H. N. Wilson. *Analytical Chemistry—The Working Tools* describes the analytical techniques used throughout the laboratories of I.C.I. and has been published in accordance with the Company's policy of making available the results of research that might be useful to industry generally.

A foreword by the late Sir Wallace Akers explains how the book came to be written. Soon after I.C.I. came into being an Analytical Chemists Committee was formed to standardise methods throughout the Company as far as possible. The committee has been at work ever since, and its various sub-committees have contributed the material which goes to make the book.

One reviewer comments: "One cannot read far in this work without having recalled half-forgotten fragments, both of the science and of the art of analysis, which may never have been seen in print before, and have often only been perpetuated in the contact of good teachers with willing and observant learners. If only for stating these things in plain terms the book is to be welcomed."

The actual compilation of the book has taken more than six years, and was undertaken by the editors in addition to their normal work. Mr. Strouts is a member of the Research Department, Head Office, and he has been secretary of the I.C.I. Analytical Chemists Committee since 1945. He was in Nobel Division from 1928 to 1952, latterly as head of the Analytical Research Section. Mr. Gilfillan is chief analyst at Lime Division and Mr. Wilson chief analyst at Billingham.

Copies of the book have been presented to university and technical college libraries throughout the country. It is published by the Clarendon Press in two volumes at £5 5s. net.

## MR. S. W. CHEVELEY

The Minister of Agriculture and the Secretary of State for Scotland have jointly appointed Mr. S. W. Cheveley, chairman of Central Agricultural Control, to be chairman of the governing body of the Foot and Mouth Disease Research Institute at Pirbright, Surrey. He succeeds Professor Wilson Smith, who has retired.

Mr. Cheveley was appointed to the governing body of the Institute earlier this year.

## ALKALI DIVISION

### T.V. and Braces Plug Safety

Television was one of the aids used to publicise safety consciousness during Wallerscote Works safety week last month.

Three cameras transmitted pictures over land-lines to a dozen viewing points—in canteens, time offices, amenity huts and open spaces. The programme each day was opened by a V.I.P. (Sir George Barnett, H.M. Chief Inspector of Factories, was among them), and the theme for the day was then introduced by a Wallerscote employee.



The "third man" who haunted Wallerscote during Safety Week. More pictures appear on page 340.

There were three main broadcasts each day; from 11.45 to noon, from 12.30 to 12.45 p.m. and 5 to 5.15 p.m. The features included panel games with a safety theme, commentaries on the day's activities illustrated by still or action shots, and news bulletins. Five automatic still-picture projectors scattered throughout the works were used to show photographs illustrating good and bad safety practice—sometimes of incidents only an hour old.

The theme of the entire week was "The Third Man." Wallerscote's safety record shows that two out of three men go through their working life of 100,000 hours without an accident—but the third man does not. A sinister "Third Man," dressed in a tall hat and black cloak, was abroad in the works during the week, and his uproariously unsafe antics were relayed by the television cameras to the viewing points.

At the beginning of the safety week each man at Wallerscote received an illustrated booklet, "Achievement," in which a message from the works manager was addressed to him by name in print. There was also a free issue of braces bearing the slogan "Don't let us down."

The television equipment used during the week was hired by the Division, with the exception of one camera chain; this has been recently bought as a time-saver for the Division engineers. Plans from the main drawing office files are to be televised to outlying drawing offices so that the correct one can be chosen with the minimum waste of effort.

### Patriotic Duty

General Sir William Morgan, G.C.B., D.S.O., M.C., Military Adviser to I.C.I., addressed a large audience of the Division's Civil Defence service at their opening meeting of the training season at Winnington on 27th September. The Division chairman, Mr. W. M. Inman, presided.

Sir William, speaking on "Civil Defence and the World Situation," told his audience: "You are learning the techniques of how to compete with a situation caused by a hydrogen bomb. Not only are you doing a patriotic and necessary duty for your country, but by the mere fact of belonging to an organisation of this kind you are providing

a deterrent to our enemies against bringing on such a situation."

A succession of questions on a variety of points followed, and Sir William was pressed to visit the Division again at a later date.

### Home-made Clubhouse

A flag bearing the letters W.P.R.U.F.C. fluttering proudly in the autumn breeze on 25th September proclaimed that Winnington Park Rugby Club's new clubhouse, built by the members themselves, was now officially open.

The flag had been hauled up by the club's first president, Mr. J. W. Gibb (joint managing director of the



Mr. J. W. Gibb hoists the flag at the new clubhouse, watched by England player Eric Evans and Winnington captain D. O. Ward

Division), performing the opening ceremony. He wished the club a long, prosperous and successful career.

To mark the occasion a special fixture had been arranged, Winnington Park versus a team of first-class players captained by England player Eric Evans. Winnington subsequently had the satisfaction of winning by eight points to three.

## DYESTUFFS DIVISION

### Miss Tilley takes a Bow

At the annual championship meeting of the Huddersfield Archers Miss Thelma Tilley (Tracing Section, Huddersfield Works) took a step up in the archery world. Miss Tilley improved her status in the sport, graduating from a novice to a third-class archer. This transition has taken barely three months, which is good going.

In the championship shoot Miss Tilley shot a Hereford





Miss Thelma Tilley is now a third-class archer

(144 arrows—72 at 80 yards, 48 at 60 yards and 24 at 50 yards) against the Gentlemen's York, which is the same number of arrows shot over distances of 100 yards, 80 yards and 60 yards. Miss Tilley, who was the only woman competitor, scored 894, using a steel bow with a draw weight of 35 lb.

### He grows Fur Coats

Mr. J. MacKenzie, a fitter in the central workshops at Grangemouth, has an unusual spare time occupation: he grows mink.

Mr. MacKenzie and partner run the Forthview Mink Farm, Old Polmont. They have been working for some years now to build up a herd of standard mink which meets the requirements of this highly selective industry. Quality rather than quantity is what they are after, and

this year they seem to have achieved their aim. The litter average for the farm is five young per female; at ten weeks old the young females are every bit as big as their dams, and the young males are considerably bigger.

Standard mink are the true breed and should be so very dark brown in colour as to appear almost blue-black; a mutation—to the layman "coloured mink"—is caused by a shift or change in the genes. This change may be one which



Mr. J. MacKenzie with a mink

affects the fur colour, and by selective breeding a mutation is established.

Mink are semi-aquatic animals and are fed on minced fresh fish scrap mixed with small quantities of yeast, liver, wheat, greens, cod liver oil and milk.

At Mr. MacKenzie's farm the males are kept in individual wire pens with a small nest box attached. Although the animals enjoy getting wet, they are apt to catch chills by lying on wet bedding. For this reason there is no bedding on the wire-bottomed nest boxes. Mink are very temperamental, particularly during the breeding season and while the young are being nurtured. During this time they have to be treated with great care and are fed and watered with as little disturbance as possible. When disturbed they have been known to eat their young.

Every one of the boxes and cages for the animals has been made by the two partners, and both are enthusiastic and happy about the success they have had this season—success achieved by constant attention to detail and well-planned work.

## PHARMACEUTICALS DIVISION

### Russians see Blackley Laboratories

A party of Russians, visiting England for the Congress of the International Pharmaceutical Federation, were shown the Pharmaceuticals Division's Laboratories at Blackley last month. They were Professor P. L. Senov, chairman of the Soviet Pharmacopoeial Commission and Professor of Pharmacy at Moscow University; Mr. A. F. Melnichenko of the Soviet Ministry of Health; Miss A. N. Oboimakova of the Pharmaceutical Society of the U.S.S.R.; their interpreter Mrs. Butrova; and a member of the U.S.S.R. Trade Delegation in Britain, Mr. N. N. Zatchiniaev.

The visitors were welcomed to the Division at a dinner given by the Commercial Director, Mr. E. D. Carey, who formally presented the delegation with a copy of *Culpeper's Herbal*, inscribed as a presentation to the Pharmaceutical Society of the U.S.S.R. After touring the laboratories the following day the Russians lunched with the chairmen of Dyestuffs and Pharmaceuticals Divisions, Dr. J. Avery and Mr. P. A. Smith. Before leaving Blackley they were given comprehensive sets of the Company's medical and veterinary literature.

## PLASTICS DIVISION

### Wilton's First Open Day

Although it coincided with an Air Force display at a nearby aerodrome and the debut of a new centre-forward for the Boro, over 260 employees, wives and friends arrived at the site on the first of Wilton's "open days" to see Plastics Division on parade. This was no ordinary parade, however; the plants were operating exactly as they do at any other time. From the moment the first bus arrived at 2.10 p.m. a steady stream of visitors toured the three plants and spent approximately two and a half hours inspecting the various processes and watching

the tests which are carried out to ensure a quality product.

The general opinion of the tour was that it was most instructive; as one employee said, "My wife is still talking about it."

At the conclusion of the tour a visit was paid to the mobile showroom, where an exhibition of moulded articles proved a great attraction.

Dr. A. M. Bloch thanked the visitors for their atten-



Visitors tour the plastics plant during Wilton's first open day

dance, and pointed out that although conditions on the plants might not be perfect it was Company policy that employees should work under the best possible conditions, and this policy had been carried out on the plants which had been open for inspection that afternoon.

Mr. W. Wright (works councillor) on behalf of the visitors thanked the management for their hospitality.

### International Bowlers at Welwyn

A combined team of bowlers from the Plastics and Paints Divisions of I.C.I. played a team of international players organised by Mr. Sydney A. Crawley, a past-president of the English Bowling Association, at Welwyn recently. The game was played for the John Paterson Memorial Trophy. (Mr. Paterson was a member of I.C.I. Head Office staff and captain of the English bowling team.) With their superior strength the visitors won the game.

At the meal after the game Mr. K. Holley, I.C.I. Plastics Division Personnel Manager and chairman of the Recreation Club, welcomed the team and their guests.

The reply was given by Mr. A. W. Macey, captain of the South African Tourists. He expressed his pleasure

on being appointed captain for the day of the international team and said the green was of a high standard and as good as any they had played on during the whole of their tour.

Mr. A. F. Gawler, president of the Plastics Division Bowling Club, said that this match, which he hoped would continue as an annual event, was one in which everyone who knew Mr. John Paterson desired to participate, be they bowler or fellow employee of the Company.

Mr. Crawley expressed his thanks to I.C.I. for the excellent arrangements made for the game and to his team for their support.

Mr. Harry Bird, captain of the Plastics Division Bowling Club, presented a pair of nylon hair-brushes to Mr. Macey, who presented the club with a South African Tourists pennant.

## SALT DIVISION

### Volunteer Rescuer

When someone is in difficulties in the waterways which divide and almost surround the town of Runcorn, the call goes out for the Runcorn Grappling Corps. Immediately a team of eight men sets out for the scene of the accident escorted by the police, and more often than not they pull off a rescue—or in grimmer circumstances make a recovery.

Mr. Joseph Griffiths (Engineering Maintenance Department) has been a member of the Runcorn Grappling Corps now for thirty years. It was founded in 1905 by a group of far-sighted citizens who recognised the dangers inherent in the town. The corps consists of eight men trained in first aid and rescue work, whose headquarters is the Runcorn station of the Cheshire Constabulary.

The Runcorn rescuers have won renown not only in Cheshire but as far afield as Lancashire, Yorkshire and North Wales. Only one other such organisation in the country has received official recognition.

Mr. Griffiths has been captain of the corps for the past four years. Its work, often carried out in the most trying and difficult circumstances, by day and night in all weathers, is entirely voluntary.

## CANADIAN INDUSTRIES (1954) LTD.

### Employees see 'Terylene' Show

More than 600 head office employees of C.I.L. filled the main ballroom of the Windsor Hotel in Montreal one day in September to get their first view of garments made from Canadian 'Terylene.'

The one-hour fashion show had already been given to top executives, buyers and sales personnel of leading department stores in Montreal and Toronto. It will also tour the West to Vancouver.

Mr. R. B. Winsor, general manager of the Textile Fibres Division, told employees: "I want to solicit your services—every one of you—as ambassadors to the retail trade." He said it was hoped that the show would help employees to answer questions about 'Terylene' put to them by their friends.



## 'TERYLENE' COUNCIL

### Horse-drawn Holiday

Mr. C. V. Haw, a headquarters patrolman, has recently completed an 80-mile tour of Yorkshire in a one horse-power vehicle. With his wife and his young son he spent a fortnight ambling through the East Riding in a home-made caravan drawn by a horse called Daisy.

Mr. Haw built the caravan in his spare time, starting from the chassis of a farm cart. Painted bright yellow and



Mr. and Mrs. Haw set out for their holiday

red, with a green canvas covering, it took him about a month to complete.

His route took him through Boroughbridge and Easingwold, along the north side of the river Swale, and back via Alwark to the river Nidd at Crowthorpe and Fountains Abbey. Mr. Haw reports that his novel holiday was a great success and that Daisy performed excellently as long as she was "in gear." When the party halted for the evening, however, Daisy would not consent to be tied, tethered or even stabled: only an open field would satisfy her.

## I.C.I.A.N.Z.

### New Office will change Melbourne Skyline

I.C.I.A.N.Z. is to have two new office buildings. In Sydney work on an eight-storey building near Government House has already begun, and in Melbourne plans for a 20-storey headquarters have just been passed by the local building regulations committee. Work on the site,

on the corner of Nicholson and Albert Streets, is expected to begin within the next twelve months.

The Melbourne building will be 230 ft. high—98 ft. higher than the regulation building height. The Melbourne press greeted the news of the city's first skyscraper with enthusiasm in such headlines as: "Buildings may go up and up," "We'll have a 'scraper," and "New skyline for the city."

The building will be of the tower type, which makes the provision of light wells unnecessary while giving every office good natural lighting, ventilation and outlook. Many prefabricated components will be used, permitting rapid construction.

At present the Melbourne staff of I.C.I.A.N.Z., numbering about a thousand, are housed in seven separate buildings. They will occupy about two-thirds of the new building, and the remainder will be let. It will be surrounded by gardens, and there will be parking space for ninety cars inside.

The Sydney building will be on Circular Quay. It occupies what is in effect a cliff-side site, so that while the ground floor is given over to garages, the main entrance is two floors up facing on to McQuarrie Street.

### New Acetylene Plant

The only Australian plant for the dry generation of acetylene went into production at Botany during August. This was the culmination of two years' work by Development Department, the last eight months concentrated on introducing safety devices in advance of any operating overseas in similar plants.

Now the trichlorethylene and P.V.C. plants can be supplied with the acetylene they need without the problem of having to dispose of thousands of tons of lime slurry every year, which was a big drawback to the old wet process.

The method generally used all over the world involves adding a high proportion of water to calcium carbide to get acetylene, and vast quantities of slaked lime are produced as a by-product. At Botany this process was producing 120 tons of lime slurry for every 100 tons of calcium carbide used. There were a few customers for this lime, but most of it was dumped in the lime pond in the sands at the back of the factory grounds.

Now the by-product is a high-grade powdered lime, which will go to the building, agricultural and chemical industries. Some of it will be used in Botany's own P.V.C. and trichlorethylene plants.

The "know-how" was bought from a German factory, and a German engineer and chemist visited Australia for a time to supervise the erection of the plant and its initial runs at the beginning of this year.

Those trials brought operating difficulties, particularly in ensuring safe working. An important feature of the built-in safety devices is the provision of instruments to measure the oxygen and combustible gas content of the inert atmosphere in the grinding system. These instruments automatically shut down the plant if either the acetylene or the oxygen concentration approaches safety limits.

# Ship's Doctor

By P. S. Powell (Southern Region)

"CAN you go to Palermo?"

Members of the staff of the Alfloc Water Treatment Service dealing with the marine side of affairs are not unaccustomed to overseas assignments, and the 'Alfloc' testing kit has been seen on the quays of Bremerhaven, Hamburg, Rotterdam, Antwerp, the northern French ports, and other places. This, however, appeared to be something out of the ordinary, offering a new experience to a representative normally bound by the county boundaries of Hampshire, west Sussex, and "a line drawn from Brighton to Aldershot."

It appeared that the newest and largest tanker belonging to a large oil company had put into Palermo in Sicily on her second voyage because of boiler trouble and that the company had requested that a technical representative of I.C.I. should visit the vessel.

Several days of indecision followed, during which a telegram saying that the trip was cancelled arrived just as the telephone was ringing, with London Office on the other end asking me to be ready to leave at once. Eventually, after a mad scramble to collect foreign currency before the banks closed, I found myself looking through the windows of the departure lounge of London Airport at the lines of aircraft standing dripping in the early morning drizzle of what was supposed to be an English summer day.

"Hallo! Where are you off to?"

A voice behind me in the bus taking the flight from the airport buildings to the waiting aircraft asked this question, and I realised that I should have company for the trip. An additional second engineer officer was also being flown out to the ship by the oil company, and he recognised me from previous meetings. And so time passed quickly as the aircraft climbed above the clouds and headed south.

Paris slid past ten miles away on the port side, followed by the green fields and ruler-straight roads

of central France. A gentleman on his way to sell a patent form of bottle cap in Milan kept us amused with a quick-fire selection of witticisms, and soon the snow-topped peaks of the Alps moved swiftly across our field of view and fell away astern. Before long it was "Fasten safety belts" as we dropped on to the tarmac at Nice airfield, ablaze in the Riviera sun.

Soon our flight was called again and the aircraft soared away once more, this time over the incredible blue of the Mediterranean which gradually became diffused in the general heat haze, giving one a sense of being suspended motionless in a void. Passengers dozed off and I lazily watched the port side engine and propeller churning us onward toward our next stop in Rome, wondering vaguely why the exhaust came in little irregular brown puffs instead of a continuous stream. As I watched, the little brown puffs became thicker. I dug the dozing "Second" in the ribs.

"That motor all right?" I asked. "Seems a bit smoky."

"Not smoke," he replied—"oil."

I beckoned the stewardess and suggested that perhaps all was not well with the engine. She gave me the sort of look that one gives a child who asks silly questions, but disappeared into the pilot's compartment. A tanned face under a peaked cap looked out, and shortly afterwards the engine was stopped, the resultant series of lurches the plane gave waking most of the sleepers. The captain of the aircraft appeared and with a disarming smile announced the obvious—that the aircraft had engine trouble and would be returning to Nice. He naively reminded us that the aircraft would fly quite well on one engine, so there was no need for alarm. The bottle top representative asked if it would still fly if the other one stopped.

After what seemed an uncomfortably long time the islets off the Riviera coast again appeared beneath,



followed by the buildings of Nice Airport. The unavoidably fast one-engine landing on this rather small airfield was followed by much screeching of brakes and strips of rubber disappearing from the tyres. We slid to a stop. "If I were a cat," said Bottle Tops, "I'd start counting."

In the airport restaurant rather unenthusiastic French waiters served a mediocre lunch to the unexpected influx of clients. Under the broiling sun white-coated mechanics worked on the engine. We sipped iced beer in the shade, watching the coming and going of other aircraft sweeping in from the sea or coming in over the white houses of the distant town. At last there was an air of expectancy among the mechanics as the faulty motor spluttered into life and was allowed to run for some time before it was slowed to a tick-over. The loudspeakers cracked out our flight number in French and English and we trooped aboard the plane once more. Again the airfield slipped away and the blue waters of the Mediterranean merged into the heat haze as we gained height, on course for Rome.

After a quick change to another plane at Rome—we only just caught the connection—a further two-hour flight brought the rocky coast of Sicily into view, where brown rocks rose sheer out of the sea for several thousand feet. We lost height and were soon flying up a valley with a brown and green mountain-side on each side of the aircraft. An impossibly small green postage stamp of an airfield appeared below, and only the thought that these Italian pilots were using it daily gave one confidence that a plane could ever be landed in such a space. Dark green foliage rushed beneath us, and a final bump brought this part of the journey to an end.

My first impression on leaving the plane was that it would be impossible to level up to the task of spending a week or more in an atmosphere resembling an overheated hothouse in the Royal Botanic Gardens. The hot, damp air seemed completely devoid of oxygen; fortunately, however, these conditions were for just an odd day. The climate, although warm, was not impossibly so.

The town of Palermo is some miles from the airport, and the drive is along sandy lanes winding through the valley of the Golden Horn—reputed to be one of the most fertile regions in the world. Orange, lemon and olive groves flanked the road on either side, extending right up the slopes of the mountains. Vines and exotic flowers appeared in profusion. Gradually the fields gave way to small houses and the

road to a metalled surface; and as we approached the town itself, the dwellings became more tumbledown and obvious war scars showed up. Many families appeared to be living in cellars or little better; and one was reminded that we are not yet all that popular in this part of the world since the allied landings during the war.

As the town centre was reached, the buildings and shops became larger and appeared to be in better repair. We had a brief glimpse of the opera house, reputed to be one of the largest in the world (the largest is, curiously enough, in Brazil). In the city centre cars, trams, and an amazing number of small motor cycles played an endless game of "dodgem," each driver a budding Ascari. These small motor cycles, which might be better described as scooters, are even fitted with sidecars and could frequently be seen carrying half a dozen passengers or more. The ladies invariably rode side-saddle, clinging to their male escorts with one hand and usually managing to stay on during the crazy weaving through other traffic.

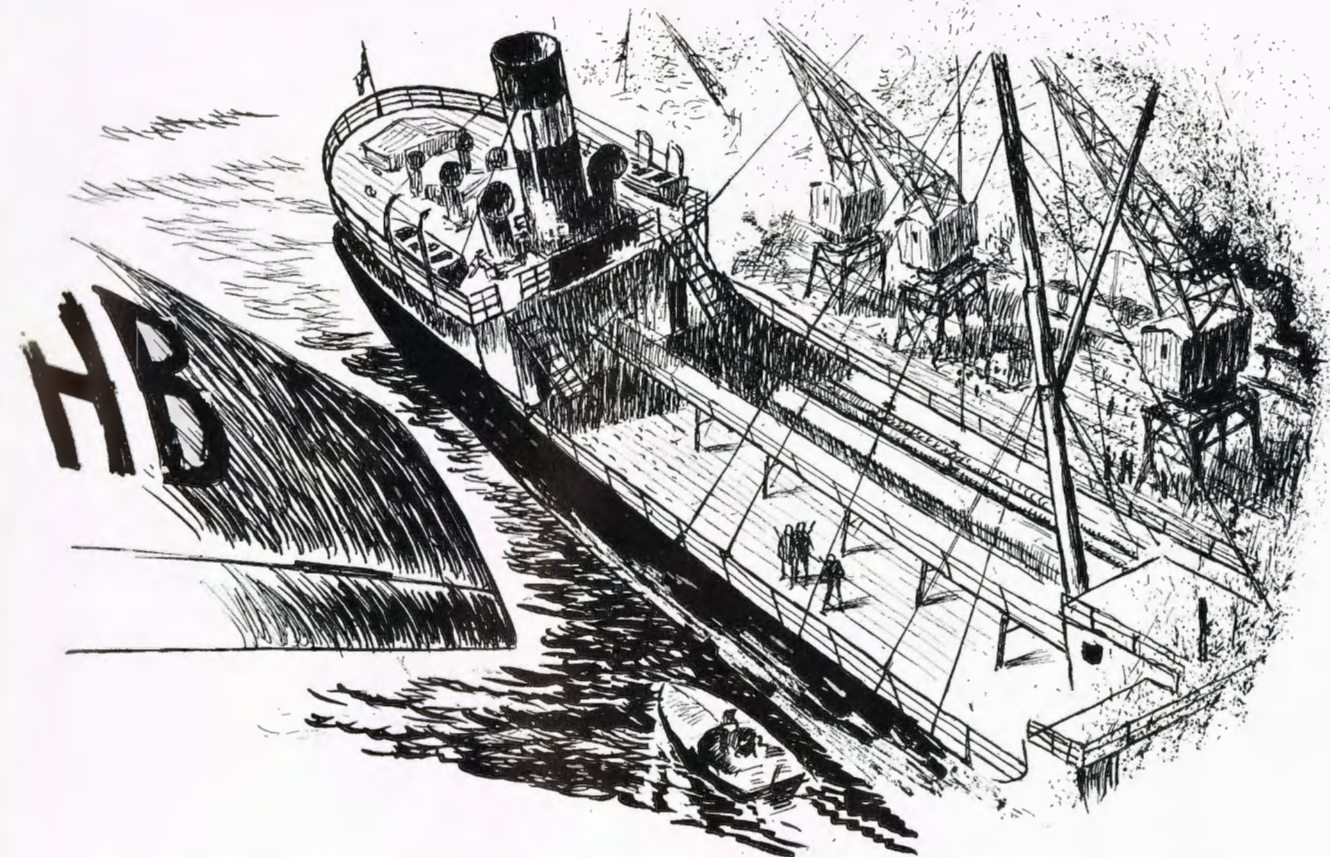
Past the rebuilt generating station the town deteriorated again, and our road finally became a cobbled track between high stone walls. Over these cranes soon began to appear, and finally the dock gates were reached where one or two swarthy-looking armed police peered into the car, exchanged a few words in Italian with the driver, and then waved us through.

Our oil tanker lay in Palermo harbour, about three times the size of any ship which had previously entered the port—a couple of feet of water beneath her keel at low water and not much more at high water, since there is very little tide in the Mediterranean. No smoke came from her funnel, and a group of armed guards lounged on her after deck. Port regulations demand that these are employed and the shipowners have to pay for them.

"Can you be ready for a conference?"

This question fired at me dispelled thoughts of a bath and meal after our 1300-mile trip during the day. The ship was costing £1750 per day to keep out of commission, and understandably no possible delay could be permitted in getting the vessel back into service. Introductions were effected to representatives of Lloyd's, the London Salvage Association, shipyard managers and the senior engineers on the ship.

And then came a week of hard work, but one of considerable interest. Drawings were examined,



... our tanker lay in Palermo harbour, about three times the size of any ship which had previously entered

materials of construction checked, component parts of the boiler system dissected and examined. Samples of various deposits had been despatched to London, but for quickness they had also been submitted to chemists at the local university and to the shipyard laboratory. Unfortunately it soon became apparent that while these people were anxious to be helpful, they had not the know-how of our London laboratories with regard to the analysis of deposits containing phosphate. Meetings, cables and airmail letters came and went, theories were supported or scrapped, and towards the end of the week there was hope that the ship would soon be away again.

The focal point of shipping interests during the evenings seemed to be centred round the "Café d'Italia" where local marsalas and vermouths were cheap and of good quality, and where a synthetic blonde crooned the latest Italian lyrics into a microphone accompanied by a bored-looking band. Norwegian sailors, barred from drink in their own country, unhappily often made a nuisance of themselves.

At last all mechanical repairs were completed and a final conference was held to decide whether the vessel could go to sea. Lloyd's agent said he was

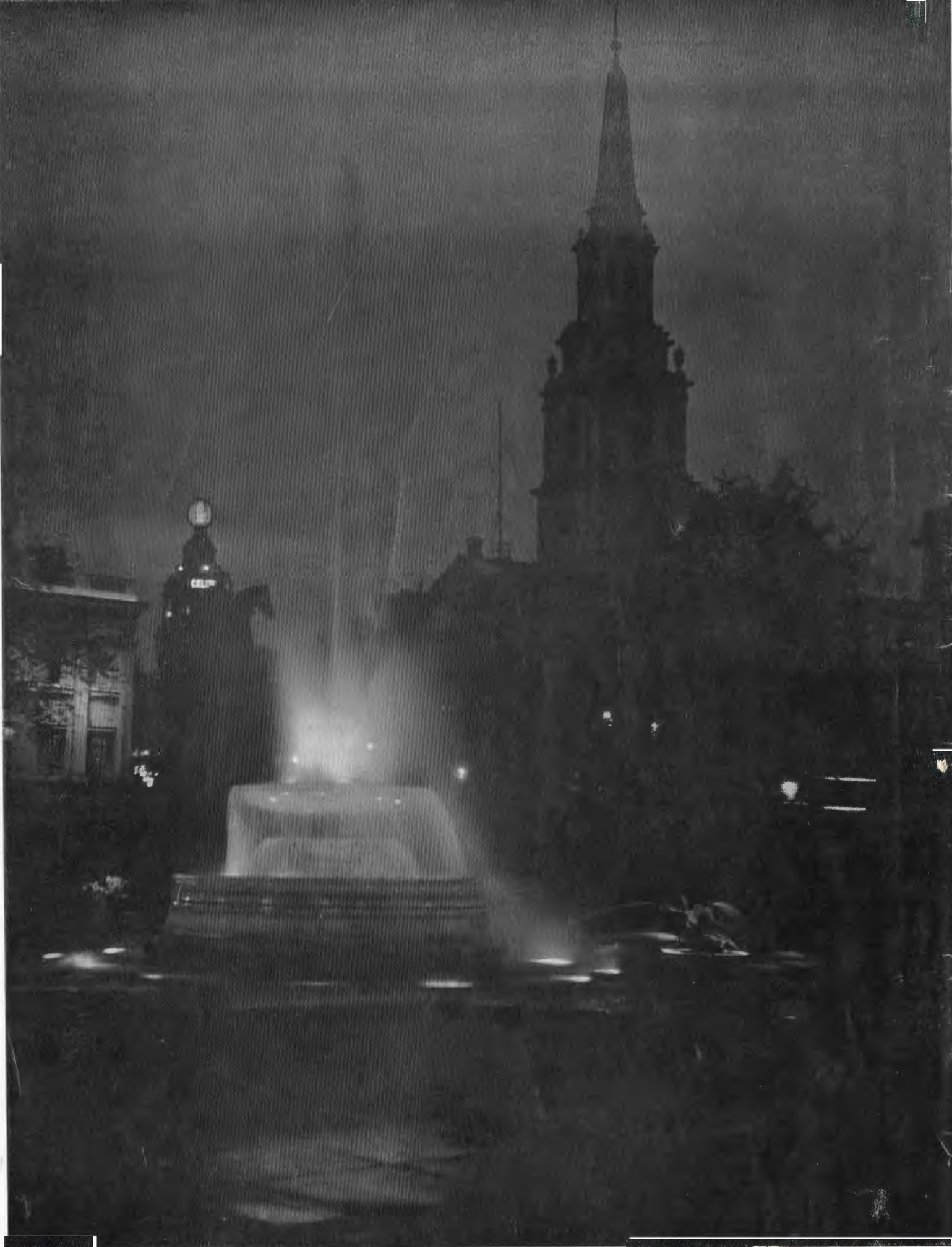
satisfied, and sailing was fixed for 6 a.m. the following morning. We were to make final tests at 4.30 a.m.

A final party at the shipyard manager's house was paralyzing in its hospitality, but it was important from a prestige point of view to avoid showing signs of being under the weather. It was well past midnight when we sank into our respective Bacchanalian stupors at the hotel.

After far too short a time the bedside telephone shrilled and a voice at the other end announced that the shipyard car had arrived to take me back to the ship. I dressed and crawled downstairs. In the hotel foyer I passed someone who was also at the party. I hoped I did not look like him!

And so down to the docks and aboard the ship for the last time. A final check indicated that things were more or less as they should be, and promptly at 6 a.m. the engine-room telegraph shrilled "Stand by" and then "Slow ahead." For the first time since the breakdown the engines turned and the ship nosed her way out of the harbour; and as I later joined the pilot in his bobbing launch and returned the waving of our new-found friends aboard the ship she increased speed towards the rising Mediterranean sun and the oilfields of the Persian Gulf.





*"Trafalgar Square"*

*Photo by Ann Cole (Hawthorndale)*